REMARKS

The specification has been editorially revised. Claims 35-49 and 84-98 have been cancelled, without prejudice. Claims 1, 3, 5, 13, 50, 62 and 73 have been amended. Claims 1-9, 11-21, 23-32, 34, 50-58, 60-70, 72-81 and 83 remain in the application. Applicants reserve the right to pursue the original claims and other claims in this and other applications. A petition for an extension of time is being filed concurrently herewith. Please charge any deficiency in the fees to Deposit Account No. 04-1073.

Claims 1-8, 13-20, 24-31, 50-57, 62-69 and 74-80 are rejected under 35 U.S.C. § 103 as being unpatentable over pages 1 and 2 and Figs. 6(a)-(d) of the present application ("AAPA") in view of Tsujimura. Reconsideration is respectfully requested.

The present invention relates to a method of making a thin film transistor ("TFT"), which involves the steps of providing impurity 5 (Fig. 1(a)) on an amorphous silicon ("a-silicon") layer 4, forming drain and source electrodes 7, 8 (Fig. 1(b)) separated by a channel region over a contact portion of the a-silicon layer, removing the impurity 5 from the channel region (Fig. 1(c)), and diffusing the impurity into the contact portion to form an ohmic contact 6 (Fig. 1(d)) within the a-silicon layer.

According to one aspect of the invention, the impurity provided on the a-silicon layer is removed after the electrodes are formed. Thus, even if the device is exposed to hydrogen plasma for a long time to remove the impurity adhered to the channel region, the impurity that is needed to form the ohmic contact 6 is not removed, and sufficient impurity can be diffused onto the a-silicon layer in a short period of time to realize the remarkable effect that the ohmic layer 6 with the lower resistance is formed.

Claim 1 recites the steps of "forming [electrodes] separated by a channel region over a contact portion with [an] amorphous silicon layer" and, "subsequently, removing . . . impurity from said channel region and diffusing said impurity into said contact portion to form a contact layer within said amorphous silicon layer." Like the claimed invention, the AAPA process includes the step of forming electrodes 66, 67 (Fig. 6(b)) separated by a channel region. The AAPA process does not, however, include the step of "subsequently . . . diffusing . . . impurity into [a] contact portion to form a contact layer within [an] amorphous silicon layer." In the AAPA process, impurity in the low resistance a-silicon layer 65 is not diffused anywhere. In the AAPA process, the a-silicon layer 65 (Fig. 6(a)) is the contact layer, and the contact layer 65 is formed prior to the formation of the electrodes 66, 67 (Fig. 6(b)).

According to the Office Action, it would have been obvious, in view of Tsujimura, to modify the AAPA process "to enable the process of diffusing the impurity into the contact portion to form a contact layer within the amorphous silicon layer." This aspect of the Office Action is not understood. The AAPA process already has an impurity-containing contact layer 65. There is no apparent reason why anyone would want to modify the AAPA process such that impurity is diffused "into the contact portion to form a contact layer within the amorphous silicon layer," when the AAPA process already has the contact layer 65. There is no apparent reason why anyone would want to have another (or a different) contact layer in the AAPA process. Tsujimura provides no motivation for any such modification of the AAPA process.

Moreover, please note that Tsujimura relates to a top gate TFT device. The Tsujimura process involves diffusion of impurity into the metal electrodes 4, 5 in a first direction -- from a layer 6 into the electrodes -- followed by removal of the layer 6, followed by formation of another layer 9, followed by diffusion of the impurity in a

second, opposite direction -- from the metal electrodes into the newly formed layer 9. Applicants do not understand how or why the Tsujimura diffusion process would be considered applicable to the AAPA process, a bottom gate TFT device, where there is no opportunity for removal of the contact layer 65 from under the electrodes 66, 67 once the electrodes are formed.

In other words, it is not understood how the Tsujimura process could be considered applicable to the formation of the contact layer in the AAPA process. The AAPA process would have to be completely reconstructed to somehow provide for diffusion of impurity into the electrodes 66, 67 from a point between the electrodes 66, 67 and the contact layer 65. The AAPA electrodes 66, 67 are formed after the contact layer 65, and the contact layer 65 would somehow have to be removed from under the electrodes 66, 67 and replaced by another layer, and neither reference suggests any mechanism or motivation for doing so.

Claims 2-8, 13-20, 24-31, 50-57, 62-69 and 74-80 should be allowable for reasons similar to those given above in connection with claim 1, and for other reasons.

Claims 9, 11-13, 21, 23, 24, 32, 34, 58, 60-62, 70, 72, 73, 81 and 83 are rejected under 35 U.S.C. § 103 as being unpatentable over AAPA in view of Tsujimura and further in view of Washizuka. Reconsideration is respectfully requested. Claims 9, 11-13, 21, 23, 24, 32, 34, 58, 60-62, 70, 72, 73, 81 and 83 should be allowable for reasons similar to those given above in connection with claim 1, and for other reasons. Washizuka is cited in the rejection for other features, not related to the arguments presented above.

Allowance of the application with claims 1-9, 11-21, 23-32, 34, 50-58, 60-70, 72-81 and 83 is solicited.

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Respectfully submitted,

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